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MODES OF SPREADING AND MEANS OF EXTINGUISHING THE MAPLE-TREE BARK-LOUSE.

BY EMILY A. SMITH.

IN the October number of the AMERICAN NATURALIST I gave the life history of *Lecanium acericorticis* Fitch, and now conclude with the modes of spreading and the best artificial means of destroying the insect.

The disposition of the female to remain upon the same tree throughout its entire existence renders the modes of spreading from tree to tree incidental to outside influences. They are conveyed from one locality to another by the transportation of the trees while the females are upon the limbs, and are so nearly the color of the tree itself that without a magnifier are easily overlooked. The waxy mass exuded by the female in which she deposits her eggs, contains a sweet substance which is much sought after by various species of flies and wasps. When the young insect emerges from the egg, the tendency is to wander about for a time before settling upon the leaves, and the presence of the wasps and flies upon the tree in search of food at this time attracts the young lice and they attach themselves to their hairy legs and are thus conveyed to other trees. The wind and rain detach the egg-mass from the limb and convey it to other localities while the eggs are yet within.

The *L. acericorticis* are kept somewhat in subjection by the aid of the natural enemies and parasites found preying upon them; but when they increase beyond the power of these friends of ours to control them, artificial means must be resorted to.

The experience of the past summer differs from that formerly known in that the insects were found upon all parts of the tree instead of remaining upon the lower branches as was heretofore supposed. They are thus made more difficult to reach. When the lice are first hatched they are very small and delicate. A wash containing an alkaline solution applied at this time is sufficient to destroy them. I found that by attaching a wire bag to a common sprinkling hose, filling the bag with soft soap and turning on the water, a soap-suds was formed which would at once kill the insects; the scarcity of the water system in small cities renders this plan impracticable, and experiments led to one plan, easily attained by all, and which proved successful the past season.

The plan recommended is as follows: Charge a fire extinguisher in the usual manner with bi-carbonate of soda and sulphuric acid; add to the water one spoonful of crude carbolic acid to every eight gallons of water. Apply this to the tree and the force from the extinguisher will convey the fluid to all parts of the tree alike; the disposition of the insects to settle upon the lower surface of the leaf and limb serve to further this plan. Two applications should be made upon the same tree; the first, three weeks after first deposition of eggs, and the second, four weeks from the first application. If the work is delayed the insects become strong and the strength of the solution must be increased, which would be liable to injure the tree itself. The actual cost is not exceeding twenty cents an application, which is trifling compared to the cost of replacing the tree. That the experiment may prove successful it is necessary to make the work thorough throughout a locality, since in a short time they return from the infested trees.

Examining the male *L. acericorticis* since my previous article, I find my doubts confirmed with reference to the non-existence of the two halters or balancers in the place of lower wings. After close examination with a high power and living specimens, I fail to find them, and conclude that in this species they do not exist, or if at all, in a rudimentary state.

M. V. Signoret states that when the male *Lecanium* is prepared to come out it lifts that membrane which rests slightly fixed by the head end. Observation with this species shows this is not reliable with all *Lecania.* When the male of this species is about to emerge from the larval scale, it backs out with the wings closely adhering to the body. The empty scales will, upon examination, be found closely attached to the leaf or limb at the head end, while at the opposite end it is loosened.

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RECENT LITERATURE.

MACALISTER'S ZOÖLOGY OF THE VERTEBRATES.[1]—This little manual is chiefly concerned with the morphology of the classes and orders of vertebrate animals, with slight, condensed references to their habits, physiology and classification, but with no chapters treating of their zoö-geographical distribution, or geological suc-

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[1] *Zoölogy of the Vertebrate Animals.* By ALEX. MACALISTER, M.D. Specially revised for American Students, by A. S. PACKARD, JR., M.D. New York, Henry Holt & Co., 1878. 12mo, pp. 134, with 59 figures.